REMARKS

Applicants appreciate the thorough examination of the application that is reflected in the final Office Action dated July 21, 2004. Claims 1-43 are pending in the application. Applicants respectfully request reconsideration of the application.

Art-Based Rejections

The Office rejects claims 1, 2, 5, 6, 9-16, 20, 23-27, 30, 31 and 34-40 under 35 U.S.C. 102(b) as being anticipated by Honkasalo et al. (USPN 5,859,843), and rejects claims 3, 4, 7, 8, 17 – 19, 21, 22, 28, 29, 32, 33 and 41-43 under 35 U.S.C. 103(a) as being unpatentable over Honkasalo et al in view of Kawable (EP0998052)..

Examiner's Response to Applicants' arguments of May 14, 2004

In the final Office Action, the Office responds to Applicants' arguments presented in the response filed on May 14, 2004, as follows:

> **Examiner's response** – Honkasalo et al. discloses a framing techniques for multi-rate CDMA communication system, wherein the number of predetermined major frame structures that correlate with the physical data rate are in accordance with the IS-95 communications standard (see claims 1-4). Honkasalo et al. teach a method for processing a frame of data, comprising: partitioning said frame of data into at least a first and second portions of data symbols (S0 and S1); assigning a first channel element to modulate data symbols of said first portion of data symbols (column 7, line 27-line58); and assigning a second channel element to modulate data symbols of said second portion of data symbols (column 7, line 27-line58). Furthermore, Honkasalo et al. teaches that a different Walsh code is used to spread each minor frame (each channel) and than the spread signals are transmitted at the same time rate over the air to mobile station. Although Honkasalo et al. only teach a CDMA transmitter (modulator), it is inherent that the basic structure of a CDMA receiver (demodulator) is an inverse of the CDMA transmitter (modulator) according to the CDMA IS-95 standard and admitted art. On page 8, lines 6-10, of the specification, the admitted art discloses that "In accordance with the CDMA communication technique, each receiver signal is spread in accordance with a PN code at the transmitting source. Moreover, each channel in the received signal is also assigned a Wash code which is used to Walsh cover the information in the channel at the transmitting source." Honkasalo et al. teaches that a different Walsh code is used to spread each minor frame (each channel) and than the spread signals are transmitted, that is, assigning a first channel element to modulate data symbols of said first portion of data symbols (for example, S0) by suing a first Walsh code; and assigning a second channel element to modulate data symbols of said second portion of data symbols (for example S1) by using a second Walsh code. This process is a channelization using orthogonal spreading in the transmitter side. A receiver has to receive the transmitted spread spectrum signal. It is inherent that the receiver despreads the chips by using the same

Walsh code used at the transmitter, that is, the receiver has to assign a first channel element to demodulate data symbols of said first portion of data symbols using the first Walsh code used at the transmitter and assign a second channel element to demodulate data symbols of said second portion of data symbols using the second Walsh code used at the transmitter.

Thus, the Office asserts that the S0 corresponds to "a first portion of data symbols" and that S1 corresponds to "a second portion of data symbols." In addition, the Office asserts that col. 7, lines 27-58 of the Honkasalo reference teaches "assigning a first channel element to demodulate data symbols of said first portion of data symbols," and 'assigning a second channel element to demodulate data symbols of said second portion of data symbols."

Applicants respectfully disagree and traverse these rejections for at least the following reasons. Applicants have diligently searched the Honkasalo reference, but find no teaching of S0 and S1 or "assigning a first channel element to demodulate data symbols of said first portion of data symbols," and "assigning a second channel element to demodulate data symbols of said second portion of data symbols."

Applicants could not find the terms S0 and S1 in the reference. Applicants note that col. 7, lines 27-58 of the Honkasalo reference discusses claims 5-10 of the Honkasalo patent. It appears that the Examiner is citing a different reference.

Applicants note that this reasoning is inaccurate. Honkasalo's teaching that minor frames of data are transmitted in parallel using multiple Walsh channels, does not suggest that different channel elements are assigned to demodulate different portions of data symbols that are from a common frame of data. Rather, Honkasalo's teaching merely suggests that the minor frames of data are transmitted on different Walsh channels. Honkasalo's teaching suggests nothing about how the different channels are demodulated at the receiver.

A conventional RAKE receiver is used to lock onto different multipath components of a signal. If a time reference is provided, then the different multipath components can be separately identified as distinct echoes of the signal separated in time. These separately identified components of the received signal can then be brought in phase and combined to yield a final composite received signal. *See* Mehrotra, A., *Cellular Radio Performance Engineering*, Norwood, MA: Artech House, 1994. A conventional RAKE receiver uses multiple correlators to

separately detect the different multipath components. The relative amplitudes and phases of the multipath components are found by correlating the received waveform with delayed versions of the signal and vice-versa. The energy in the multipath components can be recovered by combining the multi-path components in proportion to their signal strengths. *See* Garg, Vijay, K., *IS-95 CDMA and cdma2000*, Upper Saddle River, NJ: Prentice Hall PTR, 2000.

Nothing in the prior art suggests assigning different channel elements to demodulate different portions of data symbols that are from a common frame of data.

Claim 1

In addition, as noted in the previous response, the Office Action asserts that col. 4, lines 37-55 of the Honkasalo reference discloses "assigning a first channel element to demodulate data symbols of said first portion of data symbols," and "assigning a second channel element to demodulate data symbols of said second portion of data symbols." The Office asserts that these limitations are "inherent because the demodulation process is a inverse of the modulation." Applicants respectfully disagree, and submit that this is also a mischaracterization of the Honkasalo reference for at least the following reasons.

Applicants note that the present application describes a "channel element" as a "communication resource ...allocated for processing a data frame" that "may include one or more fingers for correlating with different multi-path signals. The channel element demodulates the data symbols in each received data frame." *Application* at page 2, lines 3-6. The present application also discusses an exemplary embodiment of a channel element 300, that is shown in FIG. 3, at page 8, line 4 through page 16, line 14. As noted at page 5 of the present application, partitioning a frame of data into at least first and second portions of data symbols allows the channel elements assigned to the first and second portions to demodulate the data symbols in the data frame more efficiently.

Applicants submit that nothing in column 4, lines 37-55 of the Honkasalo reference suggests "assigning a first channel element to demodulate data symbols of said first portion of data symbols," or "assigning a second channel element to demodulate data symbols of said second portion of data symbols," as recited in claim 1. Rather, column 4, lines 37-55 of the Honkasalo reference discloses:

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> FIG. 3 shows an example of a **major frame of data (100) consisting of several minor frames (110, 120, 130)**. In this example, a physical data rate of 24.0 kbps is desired and the basic data rate is 9.6 kbps. Accordingly, 24/9.6=2.5 so that two full rate frames 110 and 120 of 192 bits are concatenated with one half rate frame 130 of 96 bits in producing major frame 100.
>
> The IS-95 air interface has a forward link from the base station to the mobile station and a reverse link from the mobile station to the base station. In applying the present invention to the forward link, it is preferred that the **minor frames of data be transmitted in parallel using multiple Walsh channels**. A different Walsh code is used to spread each minor frame and then the spread signals are transmitted at the same time rate over the air to the mobile station. On the other hand, in applying the invention to the reverse link, it is preferred that the minor frames of data be concatenated and transmitted serially. (Column 4, lines 37-55 of the Honkasalo reference.)

In the final Office Action, the Office responds to Applicants' arguments presented in the response filed on May 14, 2004, as follows:

> On page 8, lines 6-10, of the specification, the admitted art discloses that "In accordance with the CDMA communication technique, each receiver signal is spread in accordance with a PN code at the transmitting source. Moreover, each channel in the received signal is also assigned a Wash code which is used to Walsh cover the information in the channel at the transmitting source." Honkasalo et al. teaches that a different Walsh code is used to spread each minor frame (each channel) and than the spread signals are transmitted, that is, assigning a first channel element to modulate data symbols of said first portion of data symbols (for example, S0) by suing a first Walsh code; and assigning a second channel element to modulate data symbols of said second portion of data symbols (for example S1) by using a second Walsh code. This process is a channelization using orthogonal spreading in the transmitter side. A receiver has to receive the transmitted spread spectrum signal. It is inherent that the receiver despreads the chips by using the same Walsh code used at the transmitter, that is, the receiver has to assign a first channel element to demodulate data symbols of said first portion of data symbols using the first Walsh code used at the transmitter and assign a second channel element to demodulate data symbols of said second portion of data symbols using the second Walsh code used at the transmitter.

As noted above, Honkasalo's teaching that minor frames of data are transmitted in parallel using multiple Walsh channels, does not suggest that different channel elements are assigned to demodulate different portions of data symbols that are from a common frame of data. Rather, Honkasalo's teaching merely suggests that the minor frames of data are transmitted on

different Walsh channels. Honkasalo's teaching suggests nothing about how the different channels are demodulated at the receiver.

A conventional RAKE receiver is used to lock onto different multipath components of a signal so that the different multipath components can be separately identified as distinct echoes of the signal separated in time. These separately identified components of the received signal can then be brought in phase and combined to yield a final composite received signal. *See* Mehrotra, A., *Cellular Radio Performance Engineering*, Norwood, MA: Artech House, 1994.

Applicants submit that the Honkasalo reference does not mention channel elements, much less suggest assignment of different channel elements to demodulate different portions of data symbols that are from a common frame of data. Accordingly, the cited prior art does not teach or suggest, for example, "assigning a first channel element to demodulate data symbols of said first portion of data symbols," or "assigning a second channel element to demodulate data symbols of said second portion of data symbols," as recited in claim 1.

Applicants respectfully submit that the cited references, taken alone or in combination, fail to teach or suggest at least the above recitations of claim 1. Accordingly, Applicants respectfully submit that claim 1 is patentable over the cited references. Applicants further submit that dependent claims 2-4 are also patentable over the cited references at least by virtue of their dependency from claim 1, and also because claims 2-4 include features that are neither taught nor suggested by the cited references. Applicants further submit that the rejections of the original claims 3 and 4 under 35 U.S.C. 103(a) were based on impermissible hindsight gleaned from the present application, and that the Office Action fails to demonstrate any motivation to combine the cryptic teachings of the cited references.

Claims 5-11, 12-19, 20-24, 25-29, 30-35, and 36-43

Claim 5 requires "partitioning said frame of data into a plurality of portions of data symbols," and "assigning a plurality of channel elements to demodulate data symbols of said plurality of portions of data symbols, respectively."

Claim 12 requires "partitioning each of said plurality of frames of data into a plurality of portions of data symbols," and "assigning a plurality of channel elements to each of said plurality of frames of data to demodulate data symbols of said plurality of portions of data symbols of each of said plurality of frames of data, respectively."

Claim 20 requires "a finger resource for partitioning said frame of data into a plurality of portions of data symbols," and "a plurality of channel elements for demodulating data symbols of said plurality of portions of data symbols, respectively."

Claim 25 requires "a finger resource for partitioning each of said plurality of frames of data into a plurality of portions of data symbols," and "a plurality of channel elements assigned to each of said plurality of frames of data to demodulate data symbols of said plurality of portions of data symbols of each of said plurality of frames of data, respectively."

Claim 30 requires "means for partitioning said frame of data into a plurality of portions of data symbols," and "means for assigning a plurality of channel elements to demodulate data symbols of said plurality of portions of data symbols, respectively."

Claim 36 requires "means for partitioning each of said plurality of frames of data into a plurality of portions of data symbols," and "means for assigning a plurality of channel elements to each of said plurality of frames of data to demodulate data symbols of said plurality of portions of data symbols of each of said plurality of frames of data, respectively."

Applicants submit that the cited references fail to teach or suggest the above limitations of claims 5, 12, 20, 25, 30 and 36 for at least similar reasons to the reasons discussed above with respect to claim 1, and thus submit that claims 5, 12, 20, 25, 30 and 36 are patentable over the cited references.

Applicants further submit that dependent claims 6-11, 13-19, 21-24, 26-29, 31-35 and 37-43 are also patentable at least by virtue of their dependency from claims 5, 12, 20, 25, 30 and 36, respectively, and also because claims 6-11, 13-19, 21-24, 26-29, 31-35 and 37-43 include features that are neither taught nor suggested by the cited references.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants submit that all pending claims in the application are patentable and in condition for allowance. Accordingly, reconsideration and allowance of this application are earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

Dated: August 13, 2004

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